

CLAIMS

1. A method of fabricating a steel part by forging, the method being characterized by the following steps:
- preparing and casting a steel having the following composition in percentages by weight: $0.06\% \leq C \leq 0.35\%$; $0.5\% \leq Mn \leq 2\%$; $traces \leq Si \leq 2\%$; $traces \leq Ni \leq 1.5\%$; $traces \leq Al \leq 0.1\%$; $traces \leq Cr \leq 1.5\%$; $traces \leq Mo \leq 0.30\%$; $traces \leq V \leq 0.5\%$; $traces \leq Cu \leq 1.5\%$; the remainder being iron and impurities that result from preparation;
 - forging a blank for the part at a temperature in the range $110^{\circ}C$ to $1300^{\circ}C$;
 - cooling the blank for the part in controlled manner in still or forced air;
 - machining the part; and
 - performing a mechanical reinforcing operation on the part at locations that are to be subjected to particularly high levels of stress.
2. A method according to claim 1, characterized in that the steel contains 5 ppm to 50 ppm of B.
3. A method according to claim 1 or claim 2, characterized in that the steel contains 0.005% to 0.04% of Ti.
4. A method according to claims 2 and 3 taken together, characterized in that the Ti content is equal to not less than 3.5 times the N content of the steel.
5. A method according to any one of claims 1 to 4, characterized in that the steel contains 0.005% to 0.06% of Nb.
6. A method according to any one of claims 1 to 5, characterized in that the steel contains 0.005% to 0.2% of S.

7. A method according to claim 6, characterized in that the steel contains at least one of the following elements: Ca up to 0.007%; Te up to 0.03%; Se up to 0.05%; Bi up to 0.015%; and Pb up to 0.15%.

8. A method according to any one of claims 1 to 7, characterized in that the C content of the steel lies in the range 0.06% to 0.20%.

9. A method according to claim 8, characterized in that the Mn content of the steel lies in the range 0.5% to 1.5%, and in that the Cr content lies in the range 0.05% to 1.5%.

10. A method according to claim 8 or claim 9, characterized in that the Cu content of the steel lies in the range 0.5% to 1.5%.

11. A method according to any one of claims 1 to 7, characterized in that the C content of the steel lies in the range 0.25% to 0.35%, the Si content lies in the range traces to 0.5%, the Mn content lies in the range 0.8% to 2%, the Cr content lies in the range 0.5% to 1.5%, the Mo content lies in the range 0.05% to 0.20%, the B content lies in the range 5 ppm to 50 mm, and the Ti content lies in the range 0.005% to 0.04%.

12. A method according to any one of claims 1 to 7, characterized in that the C content of the steel lies in the range 0.20% to 0.35%, the Si content lies in the range 0.5% to 2%, the Mn content lies in the range 0.8% to 2%, the chromium content lies in the range 0.5% to 1.5%, the molybdenum content lies in the range 0.05% to 0.20%, the boron content lies in range traces to 50 ppm, and the Ti content lies in the range 0.005% to 0.04%.

13. A method according to claim 12, characterized in that annealing is performed in the range 300°C to 500°C for a period of 1 h to 3 h after machining or after controlled cooling in air and prior to machining.

5

14. A method according to any one of claims 1 to 13, characterized in that the mechanical reinforcing operation is deep rolling.

10 15. A steel forging, characterized in that it is obtained by the method according to any one of claims 1 to 14.

16. A steel forging according to claim 15, characterized in that it constitutes a crank shaft for an IC engine.

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17. A steel forging according to claim 16, characterized in that the mechanical reinforcing operation is performed on the webs connecting the crank pins and the journals of the crank shaft.

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